

Claims

1. A capacitor sensing inspection system, the system comprising a pair of capacitors, the first capacitor in use having a reference package as a dielectric, the second capacitor in use having a package to be measured as a dielectric, the system having a measurement circuit for providing a first indication when the capacitance of the first capacitor is substantially greater than the capacitance of the second capacitor and a second indication when the capacitance of the first capacitor is substantially less than the capacitance of the second capacitor, the first and second indications being indicative of differences between the reference package and the package to be measured and wherein the system further comprises a potentiometer having a variable position for adjusting a balance point of the measurement circuit so as to equalise a response between the first and second indications,
characterised in that the capacitor system further comprises an auto-balancer for controlling the balance point, wherein upon activation of the auto-balancer, the potentiometer is adapted to be moved into a first position where a first indication is received from the measurement circuit and into a second position where a second indication is received from the measurement circuit, the auto-balancer being then adapted to move the potentiometer position into a position substantially midway between said first and second positions so as to automatically provide a balance point for the measurement circuit.
2. A system according to claim 1, wherein the activation of the auto-balancer is by means of a user operable switch.
3. A system according to claim 1 or claim 2, wherein the auto-balancer comprises a motor coupled to the potentiometer for moving the potentiometer between the first and second positions.

4. An optical disc inspection system, including the capacitor sensing system of any one of claims 1 to 3.
5. An inspection system comprising:
 - 5 a transport mechanism for moving at least one package from a start point towards an end point,
 - a stop movable between an inactivate position and an activate position, wherein in the activate position the stop prevents the progress of items along the conveyor belt from the start point to the end point,
 - 10 a control system responsive to a user input to place said inspection system in a teach mode,
 - wherein upon receipt of the user input, the control system activates the stop and upon the exiting of the inspection system from the teach mode causes the stop to move to the inactive position.
- 15 6. An inspection system according to claim 5, wherein the control system is adapted to stop the transport mechanism in response to the user input.
- 20 7. An inspection system according to claim 6, wherein the control system is adapted to apply a delay between activating the stop and before stopping the transport mechanism.
- 25 8. An inspection system according to any one of claims 5 to 7, wherein the transport mechanism comprises a conveyor belt system.
9. An inspection system according to claim 8, wherein said conveyor belt system is a twin belt conveyor.
- 30 10. An inspection system according to claim 9, wherein axis of motion of the stop is substantially perpendicular to the direction of travel of the

conveyor.

- 5 11. An inspection system according to claim 9 or claim 10, wherein in the inactivate position, the stop rests below and between the belts of the conveyor system.
- 10 12. An inspection system for inspecting at least one package as it moves along a conveyor belt, the inspection system having a capacitor sensing system comprising a pair of capacitors, the first capacitor, in use, having a reference package as a dielectric, and wherein the second capacitor is disposed about the longitudinal axis of a conveyor belt carrying the at least one package to be inspected such that, in use, the second capacitor uses the at least one package as a dielectric,
- 15 the system being characterised in that the first capacitor is positioned remotely from said conveyor belt.
- 20 13. An inspection system according to claim 12, wherein the first capacitor is located in a control panel enclosure of the inspection system.
14. An inspection system according to claim 13, wherein an opening is provided in said control panel enclosure defining a slot for receiving the reference package.
- 25 15. An inspection system according to claim 14, wherein a first plate of the first capacitor is disposed on one side of the slot and the second plate of the capacitor is disposed on the opposing side of the slot.
- 30 16. An inspection system according to claim 14, wherein a first plate of the first capacitor is disposed above the slot and the second plate of the capacitor is disposed below the slot.

5 17. An inspection system according to anyone of claims 14 to 16, wherein the control panel enclosure includes an actuator for ejecting a reference package through the slot opening.

10 18. An inspection system for inlay cards in optical disk packages, comprising:
a transport mechanism for moving at least one optical disk package along a longitudinal axis,
a first sensor for identifying the arrival of an optical disk package at a test location along the longitudinal axis,
a second sensor disposed about said test location, the second sensor being a light sensitive sensor having an associated light source and
15 wherein the light sensitive sensor is positioned on one side of the transport mechanism and the light source is positioned on an opposing side of the transport mechanism along an axis which is inclined relative to the longitudinal axis, such that the second sensor is disposed to provide an indication of the presence of an inlay card in an optical disk
20 package when the first sensor identifies the arrival of an optical disk package.

25 19. An optical disc inspection system according to claim 18, further comprising a capacitive sensing arrangement for detecting the presence of one or more optical discs in an optical disc package.

30 20. An optical disc inspection system according to claim 18 or 19, further comprising a colour/pattern recognition sensor for testing the correct presence of printed matter on a top surface of a package.

21. An optical disc inspection system according to anyone of claims 18 to 20, further comprising a colour/pattern recognition sensor for testing the correct presence of printed matter on a bottom surface of a package.
- 5 22. An inspection system for packaged goods comprising:
a first pattern\colour recognition sensor in use indicating the presence of
a reference pattern\colour in a package, and
a capacitor sensing system for comparing the capacitance of a pair of
capacitors and providing an indication when the capacitances are not
10 substantially the same, the first capacitor of the pair having, in use, a
reference package as a dielectric, and the second capacitor of the pair
having, in use, the package to be tested as a dielectric, and
wherein the first pattern\colour recognition sensor is used to indicate the
correct presence of printed matter on one side of the package and the
15 capacitor sensing system is used to indicate the correct contents in a
package.
23. An inspection system according to claim 22, further comprising a second
pattern\colour recognition sensor which, in use, is adapted to indicate the
20 presence of a reference pattern\colour on the opposite side of the
package to the first sensor to indicate the correct presence of printed
matter on that side of the package.
24. An inspection system for packaged goods comprising:
25 a first sensor for detecting the arrival of a packaged good in a test
location,
a second sensor disposed about the test location and configured to
provide a continuous output representing a pass or fail status for the
contents of the test location,
30 output means adapted to provide an output indicative of the output of the
second sensor in response to the detection by the first sensor of the

5 arrival of the packaged good in the test location, and
wherein the output means is adapted to provide an immediate pass
output if a pass status is provided by the second sensor and in the event
of a fail status is further adapted to continue to test for a pass status from
the second sensor for a first delay time.

10 25. An inspection system according to claim 24, wherein said output means
is adapted to provide a fail output when said first delay time has elapsed
and no pass status was detected from the second sensor during the first
delay period of time.

26. An inspection system according to claim 24 or 25, wherein the second
sensor is a colour/pattern recognition sensor.

15 27. An inspection system according to claim 24 or claim 25, wherein the
second sensor is a capacitive sensing arrangement comparing the
capacitance of a reference capacitor with a measurement capacitor.

20 28. An inspection system according to any one of claims 24 to 27, further
comprising a third sensor disposed about the test location and configured
to provide a continuous output representing a pass or fail status for
contents of the test location,
wherein the output means are adapted to provide an output indicative of
the output of the third sensor in response to the detection by the first
25 sensor of the arrival of the packaged good in the test location, to provide
an immediate pass output if a pass status is provided by the third sensor
and in the event of a fail status is further adapted to continue to test for a
pass status from the third sensor for a second delay time.

29. An inspection system according to claim 28, wherein said first and second delay times are different.

5 30. An inspection system according to anyone of claims 24 to 27, wherein the system further comprises a sensitivity adjustment means which alters the effective sensitivity of the second sensor by altering the first delay time.

10 31. A discard mechanism for a conveyor belt system, the conveyor belt system adapted for moving at least one package from a start point towards an end point along a longitudinal axis and comprising a first belt located adjacent to a first edge of the conveyor belt system and a second belt located adjacent to an opposing edge of the conveyor belt system, and wherein said first and second belts co-operate to move the at least one package towards the end point, the discard mechanism comprising:
15 an opening for receiving a package, the opening being positioned between the first and second belts,
an arm movable between a rest position external to the conveyor belt system and an active position, such that when the discard mechanism is
20 activated, the arm is moved from the rest position to the active position displacing one of the at least one packages from one of the belts, thus allowing the package to fall through and be discarded through the opening.

25 32. A discard mechanism according to claim 31, wherein the arm is movable along an axis transverse to the longitudinal axis.

30 33. A discard mechanism according to claim 31 or claim 32, wherein the rest position is adjacent to an external edge of one of the belts.

34. A discard mechanism according to anyone of claims 31 to 33, wherein the active position is adjacent to the internal edge of one of the belts.
- 5 35. A discard mechanism according to anyone of claims 31 to 34, wherein the active position is over the opening.
- 10 36. A discard mechanism according to anyone of claims 31 to 35, further comprising an inclined surface provided on the opposite side of the conveyer belt system to the movable arm such that as an edge of a package is displaced by the movable arm, an opposing edge of the item moves along the inclined edge.
- 15 37. A discard mechanism according to any one of claims 31 to 36, wherein said movable arm has mounted thereon means for providing a downward force on an package item to assist the downward fall of the package through the opening.
- 20 38. A discard mechanism according to claim 37, wherein the means for providing a downward force may comprise an air blower.
39. A discard mechanism according to any one of claims 31 to 38, further comprising a sensor for detecting the arrival of a package to be discarded.